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Institute for
Infocomm Research
A*STAR

04-186

June 20, 2008

Ex Parte

ORIGINAL

FILED/ACCEPTED

JUN 23 2008

Federal Communications Commission
Office of the Secretary

Marlene H. Dortch, Secretary
Federal Communications Commission (FCC)
445 12th Street, SW
Washington, DC 20554

Re: FCC Public Notice dated 5th October 2007 - ET Docket No. 04-186

Dear Ms. Dortch:

On June 20, 2008, Ser Wah Oh and Bruce Tran Phuoc Cuong Le of Institute for Infocomm Research (I²R) submitted a device to the Office of Engineering and Technology (OET) for the white space prototype testing. In addition, Ser Wah and Bruce met with Rashmi Doshi, William Hurst and Steven Jones of OET to discuss operation of the I²R device and provide instruction on their use. I²R also provided OET with written documentation for the device, a copy of which is attached hereto.

Pursuant to the Commission's rules, a copy of this notice is being filed electronically in the above-referenced docket. If you require any additional information please contact the undersigned at swoh@i2r.a-star.edu.sg or (65) 68741948.

Yours Sincerely,

Ser Wah Oh
Project Manager / Research Scientist
Institute for Infocomm Research

cc: meeting participants

Enclosure

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I²R White-Space Device

1 System Overview

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The Institute for Infocomm Research (I²R) white-space device is a platform with integrated hardware and software components for exploring possible white space within the TV bands. It is part of a longer term vision for cognitive radio (CR) realization.

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The device is capable of detecting any signal that is present at the designated bands regardless of which standard it follows (i.e., blind detection). Since the method used is based on blind detection, no classification of signal type is available.

15 This device does not include a radio transmitter.

Key components of the device include:
1. Omni-directional antenna
   - For receiving RF signal
20   - Passive
2. TV tuner (commercial off-the-shelf from Freescale)
   - Receiving TV radio signal and translating to IF
   - Auto-configuration through GUI
3. Mixed-signal and digital processing boards
25   - Performing ADC, digital down conversion and filtering
   - Implementation on Xilinx FPGA and TI DSP
4. Computer
   - Configuration and graphical user interface
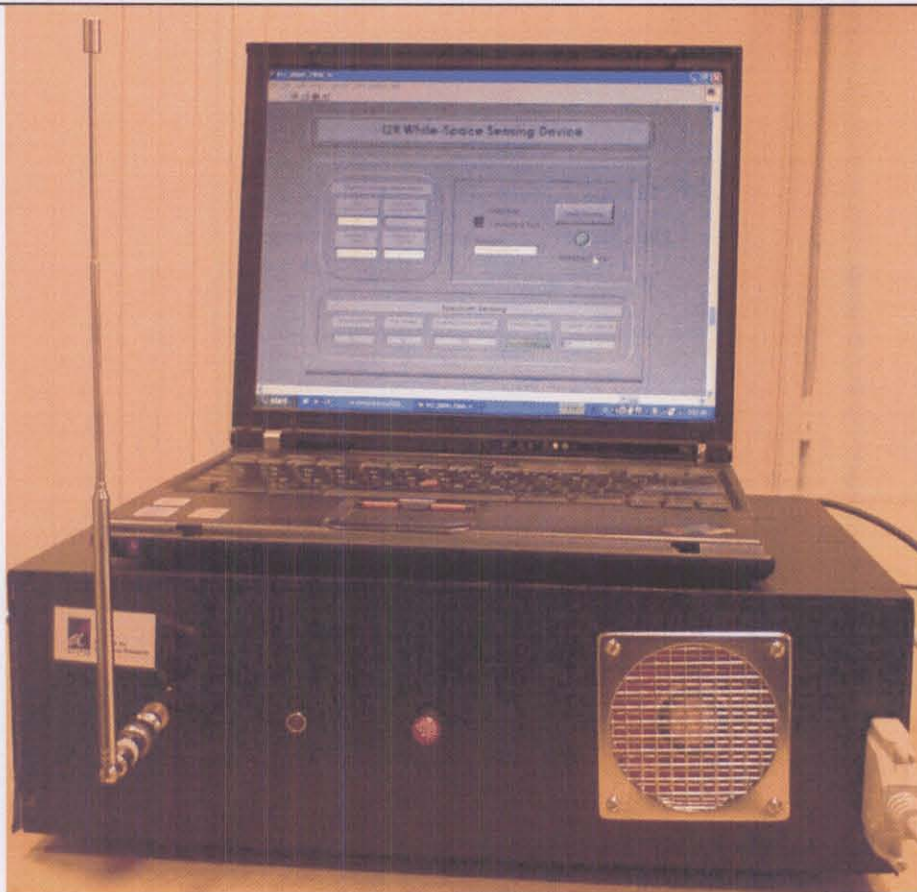   - Report generation
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Figure 1: I²R white-space sensing device.

2 System Specifications

2.1 System

Item	Parameter
Frequency range	512MHz – 698MHz (USA Channel 21 – 51)
Bandwidth	6MHz
Dynamic range	Calibrated from -50dBm up to -123dBm
Captured data time	~0.8s
Processing time	Real time
Field test	Yes

2.2 TV Tuner

Item	Parameter
Frequency range	48MHz – 1000MHz
Channel raster	250kHz
Bandwidth supported	6MHz, 7MHz, 8MHz

2.3 Baseband

Item	Parameter
ADC	14 bits
Supported signal	Any (blind)
Signal classification	No
Automatic gain control	No
Interface to PC	JTAG (parallel port)

3   User Interface
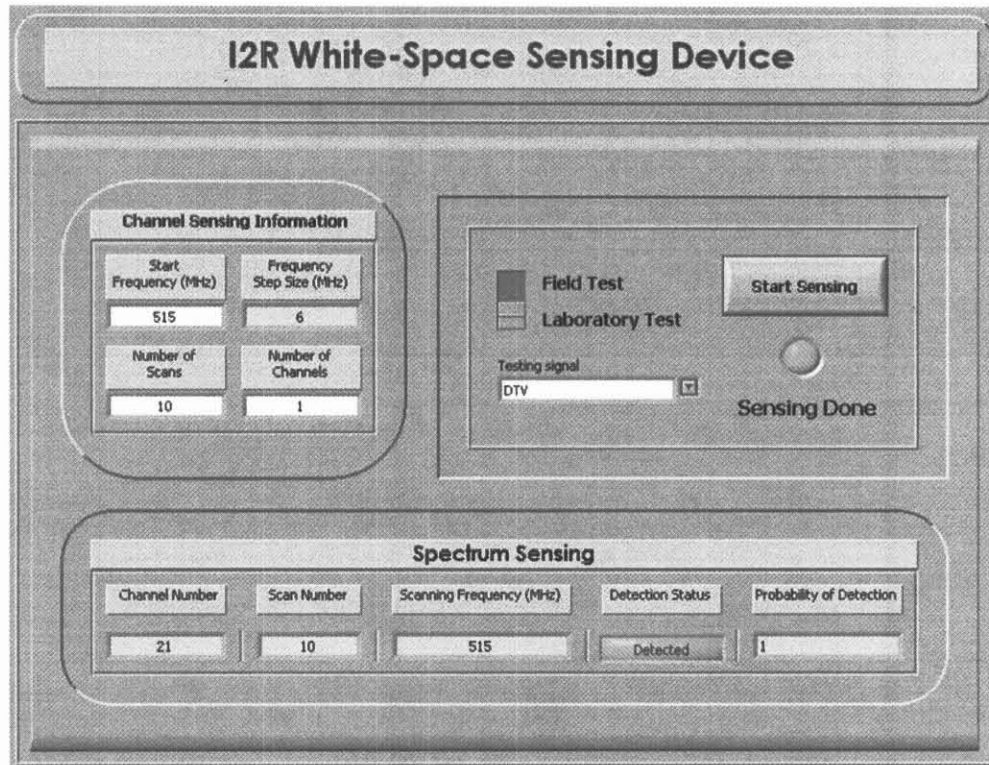
3.1   Graphical User Interface

Figure 2: Graphical user interface for configuring the device and displaying of sensing results

The graphical user interface (GUI) communicates to the TI DSP through RTDX interface. It allows the following functions:

1. Selection of test signals and types
2. Configuration of start frequency, number of channels and number of scans
3. Calculation of probability of detection in real time
4. Display of detection status
5. Report will be generated in files
6. Indication of completion of sensing

3.2   Report

Output in CSV format (for easy exporting to Excel), which includes

1. USA channel number
2. Frequency being scanned
3. Detection status (1 = signal present, 0 = no signal present)
4. Probability of detection

Example output file

```
Channel No:    36,     36,     36,     36,
Freq(MHz):    605,    605,    605,    605,
Detection:      1,      1,      1,      1,
Pd: 1.00000
```

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The output file may be imported into Microsoft Excel by using ',' and ':' as separators for post-processing, if required.

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4   Contacts

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